

IN THE CLAIMS

Please amend claims 1, 6, 8-11, 14, and 19 as follows:

1. (CURRENTLY AMENDED) A circularly polarized antenna system, comprising:  
a circularly-polarized antenna having a first area;  
a high-impedance buffer surface, ~~surrounding the circularly-polarized antenna,~~ and disposed between the circularly polarized antenna and a ground plane, wherein a surface area of the high-impedance buffer surface area is greater than the first area such that a border area of the high-impedance buffer surface surrounds the circularly-polarized antenna; and  
wherein a width of the border area of the high-impedance buffer surface ~~between the circularly-polarized antenna and the ground plane~~ is selected to achieve an H-plane radiation pattern substantially identical to an E-plane radiation pattern over a desired scan angle.
2. (ORIGINAL) The antenna system of claim 1, wherein the ground plane is a metallic ground plane.
3. (ORIGINAL) The antenna system of claim 1, wherein the width  $x$  of the high-impedance buffer surface is in the order of several wavelengths of the energy emitted by the circularly polarized antenna.
4. (ORIGINAL) The antenna system of claim 1, wherein the high impedance buffer surface comprises a substrate having plurality of capacitive elements.
5. (ORIGINAL) The antenna system of claim 4, wherein the capacitive elements are edge coupled.
6. (CURRENTLY AMENDED) The antenna system of claim 5, wherein the capacitive elements are coupled to a conductive via electrically connecting the capacitive element to the ~~metallic~~ ground plane.

7. (ORIGINAL) The antenna system of claim 1, wherein the high impedance buffer comprises a substrate having:

a sheet capacitance defined according to  $C = \frac{w(\epsilon_1 + \epsilon_2)}{\pi} \cosh^{-1}\left(\frac{a}{g}\right)$ ;

a sheet inductance according to  $L = \mu t$ ;

a resonance frequency according to  $\omega = \frac{1}{\sqrt{LC}}$ ;

and a bandwidth according to  $\frac{\Delta\omega}{\omega_0} = \frac{\sqrt{\frac{L}{C}}}{\sqrt{\frac{\mu_0}{\epsilon_0}}}$ ; and

wherein  $a$  is a lattice constant,  $g$  is a width of a gap between capacitive elements on the substrate,  $w$  is a width of each of the capacitive elements,  $t$  is a thickness of the substrate,  $\epsilon_0$  is the free-space permittivity constant,  $\epsilon_1$  and  $\epsilon_2$  are permittivity constants of the substrate,  $\mu_0$  is the free-space permeability constant,  $\mu$  is the permeability constant of the substrate,  $\Delta\omega$  is the bandwidth around a center frequency  $\omega_0$ .

8. (CURRENTLY AMENDED) The antenna system of claim [[5]] 7, wherein the bandwidth is the Ku band, and the lattice constant  $a$  is approximately 0.145 inches, the gap width  $g$  is approximately 0.02 inches, and the substrate thickness  $t$  is approximately 0.62 mil.

9. (CURRENTLY AMENDED) The antenna system of [[claim]] claim 1, wherein:  
the circularly polarized antenna comprises a phased array having a plurality of array elements;  
and  
each of the array elements are separated by the high-impedance buffer surface.

10. (CURRENTLY AMENDED) The antenna system of claim [[2]] 4, wherein the width of the high-impedance buffer surface separating the capacitive elements is approximately 1/8 wavelength of the energy emitted by the circularly polarized antenna.

11. (CURRENTLY AMENDED) A circularly polarized antenna system, comprising:  
a circularly-polarized antenna having a first area;

means for electrically isolating the circularly polarized antenna from a ground plane, wherein  
a surface area of the means for electrically isolating the circularly polarized antenna is greater than  
the first area such that a border area of the means for electrically isolating the circularly polarized  
antenna surrounds the circularly polarized antenna;

wherein a width of the border area of the means for electrically isolating the circularly  
polarized antenna ~~from the ground plane~~ is selected to achieve an H-plane radiation pattern  
substantially identical to an E-plane radiation pattern over a desired scan angle.

12. (ORIGINAL) The antenna system of claim 11, wherein the ground plane is a  
metallic ground plane.

13. (ORIGINAL) The antenna system of claim 11, wherein the width of the means for  
electrically isolating the circularly polarized antenna from the ground plane is in the order of several  
wavelengths of the energy emitted by the circularly polarized antenna.

14. (CURRENTLY AMENDED) The antenna system of claim 11, wherein the means  
for electrically isolating the circularly polarized antenna from ~~[[a]]~~ the ground plane comprises a  
plurality of capacitive elements.

15. (ORIGINAL) The antenna system of claim 14, wherein the capacitive elements are  
edge coupled.

16. (ORIGINAL) The antenna system of claim 15, wherein the capacitive elements are  
coupled to a means for electrically connecting the capacitive element to the metallic ground plane.

17. (ORIGINAL) The antenna system of claim 11, wherein the means for electrically isolating the circularly polarized antenna from a ground plane comprises a high impedance surface on a substrate having:

a sheet capacitance defined according to  $C = \frac{w(\epsilon_1 + \epsilon_2)}{\pi} \cosh^{-1}\left(\frac{a}{g}\right)$ ;

a sheet inductance according to  $L = \mu t$ ;

a resonance frequency according to  $\omega = \frac{1}{\sqrt{LC}}$ ;

and a bandwidth according to  $\frac{\Delta\omega}{\omega_0} = \frac{\sqrt{\frac{L}{C}}}{\sqrt{\frac{\mu_0}{\epsilon_0}}}$ ; and

wherein  $a$  is a lattice constant,  $g$  is a width of a gap between capacitive elements on the substrate,  $w$  is a width of each of the capacitive elements,  $t$  is a thickness of the substrate,  $\epsilon_0$  is the free-space permittivity constant,  $\epsilon_1$  and  $\epsilon_2$  are permittivity constants of the substrate,  $\mu_0$  is the free-space permeability constant,  $\mu$  is the permeability constant of the substrate,  $\Delta\omega$  is the bandwidth around a center frequency  $\omega_0$ .

18. (ORIGINAL) The antenna system of claim 17, wherein the bandwidth is the Ku band, and the lattice constant  $a$  is approximately 0.145 inches, the gap width  $g$  is approximately 0.02 inches, and the substrate thickness  $t$  is approximately 0.62 mil.

19. (CURRENTLY AMENDED) The antenna system of [[claim]] claim 11, wherein:  
the circularly polarized antenna comprises a phased array having a plurality of array elements;  
and

each of the array elements are separated by the high-impedance-buffer means for electrically isolating the circularly polarized antenna.

20. (ORIGINAL) The antenna system of claim 19, wherein a width of the high-impedance buffer surface separating the elements is approximately  $1/8$  wavelength of the energy emitted by the circularly polarized antenna.